User's Manual
PG-32200 Series
PG-32400 Series
Pattern Generator with Logic Analyzer

Revision Ⅱ
Software Win98/me/2000/xp/Vista

CLOCK COMPUTER CORP.
http://www.clock-link.com.tw

Item Checklist

1. The PG-32200 / PG-32400 Series Plastic unit.
2. There are 4 models of PG-32200 Series and PG-32400 Series.
   - ☐ PG-32200K: (200MHz, 256 K Memory).
   - ☐ PG-32200M: (200MHz, 1 Mega Memory).
   - ☐ PG-32400K: (400MHz, 256 K Memory).
   - ☐ PG-32400M: (400MHz, 1 Mega Memory).
3. Four harness with color wires and 50 pcs Easy Hook clips.
4. PG-32200 / PG32400 Series User's Manual X 1.
5. CD for PG-32200 / PG-32400 Series driver X 1.
6. USB 2.0 cable X 1 (Mini Type).

System Requirements

In order to use the PG-32200 /PG-32400 Series, the following equipment is necessary:

Computer System:	Pentium PC system with at least one USB interface (USB 1.1 or 2.0 version).
Memory:	A minimum of 256 MB free RAM. 512 MB or 1GB is better.
Mass Storage:	At least one CD drives and hard disk drives.
Display Adapter:	At least one of VGA Adapter **(Resolution 1440x900 is better).**
Monitor:	Any monitor compatible with the above display adapter.
Operation System:	Windows 98/ME/2000/XP.

Installing Hardware

Installing PG-32200 / PG-32400 Series with USB 2.0 cable.

Please follow these instructions for installing the PG-32200 / PG-32400 Series with USB cable.

1. Turn off the computer and all peripherals connected. Remove the computer power cord from the wall outlet. Locate an available USB (version 1.1 / 2.0) interface.
2. Connect the included USB cable to USB interface.
3. Connect the other end of the USB cable to the PG-32200 / PG-32400 Series USB port.
4. After checking all connections, turn on the computer and peripherals. You are now ready to install the software.

LED Display

When USB cable connected PG-32XXX is ready the LED color indicate “GREEN”.
When PG-32xxx program running the LED color indicate “YELLOW”.

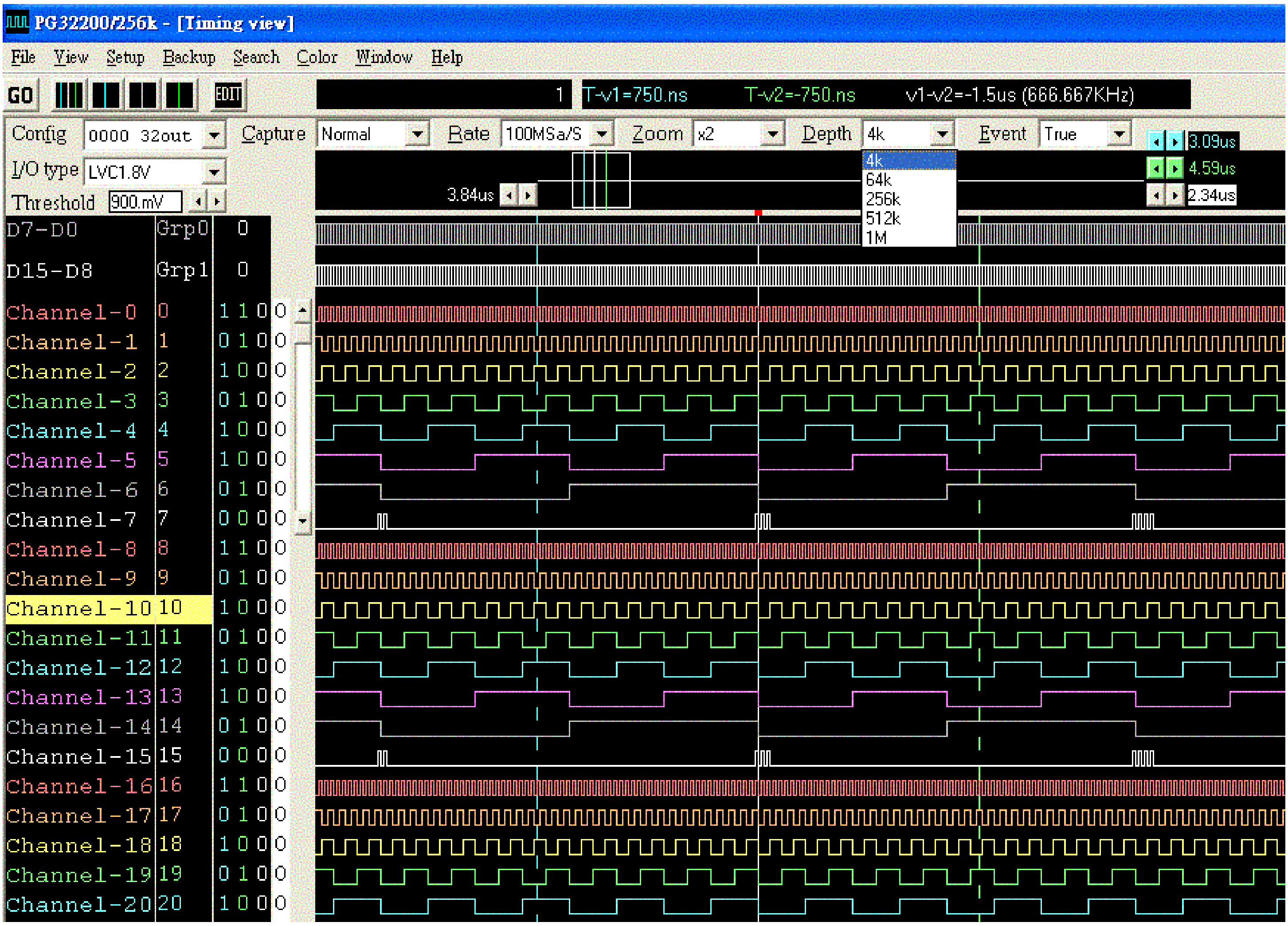
Installing Software

1. Insert the distribution CD into drive E: (hear "E" is CD driver).
2. Run E: \PG-32200\Setup.exe.
3. Follow the on screen instructions.

Guide To Operations

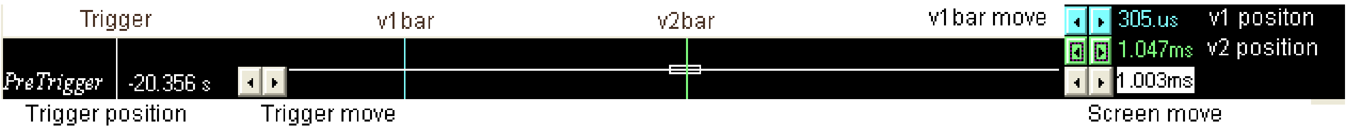
When making measurements with the Logic Analyzer, meaningful data can only be captured with some prior knowledge of the characteristics of the circuit under test. before initiating any capture cycles, the Logic Analyzer must be configured using the control program. See the software section later in the manual for instructions on these procedures. To connect the Logic Analyzer to the test circuit, a series of mini-clips on the Logic Analyzer Pod for the Logic input channels. The Logic Analyzer has inputs for 32 channels, At times, it may also be necessary to connect the test circuit to the computer system itself. This will eliminate more noise in the test application due to ground level differentials. This is especially true when dealing with high speed timing analysis. Use a heavy gauge wire to make a connection between the test circuit ground and the case of the computer.

Main Screen



The data is displayed as a timing waveform. Each channel is displayed in it's own color. Channel names, numeric value of data at each cursor and scrollbars are also in this view. The window can be zoomed in or out to show just a few samples or the entire buffer. Data can be displayed on screen as a timing waveform. Each channel can have a user-specified name and can be displayed in any sequence. Channels can be also be grouped together into busses and viewed in ASCII, hexadecimal, decimal, binary, or in user defined mnemonics. Time between V1bar, V2bar, and Trigger is displayed. Zoom scales of 1/200X to 50X (horizontal). Indicator of current position of buffer shown on screen. The color of each channel can be set independently.

Horizontal Scroll Bar



This scroll bar is used in conjunction with a selected waveform or cursor.
The Horizontal Scroll Bar will move a selected waveform or cursor left or right in the Display area.
The Horizontal Scroll Bar works with Display, Logic Analyzer channels, V1Bar, V2Bar, and Trigger Cursor.

Hardware Specification

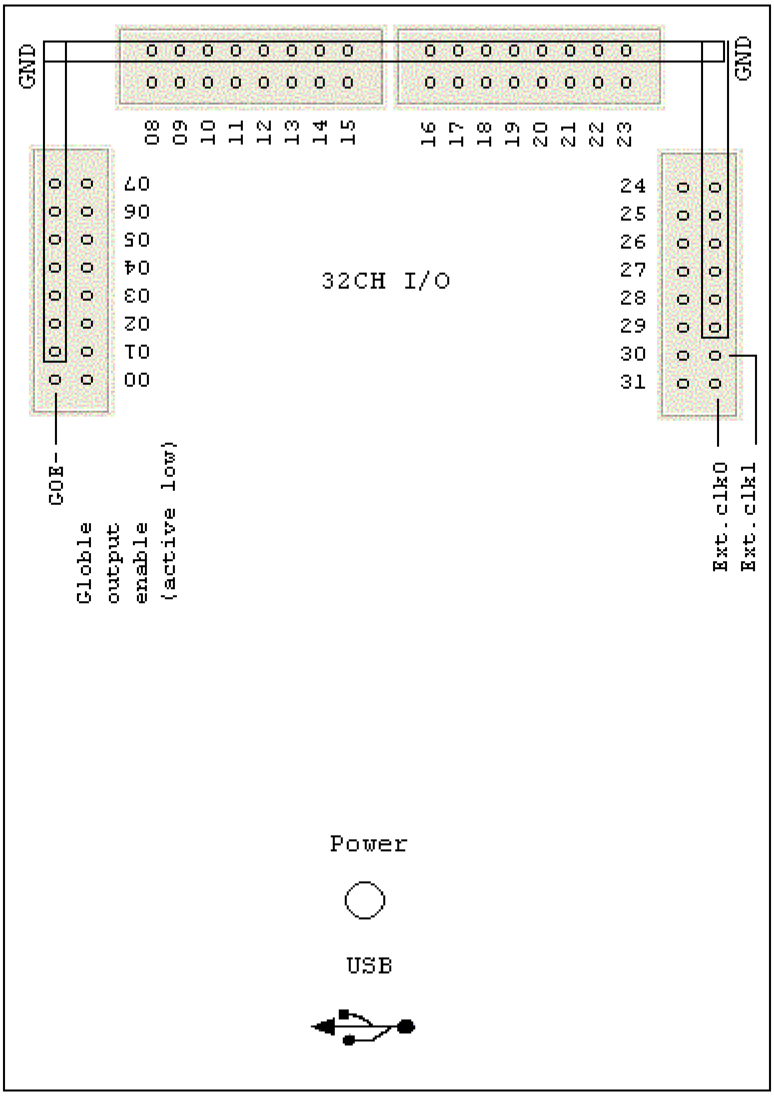
PG-32400 Series Specifications

Model	PG-32400K [512K]	PG-32400M [2 Mega]	Remark
Pattern update rate Logic sampling rate	From 1Sa/s to 400 Msa/s		With 1, 2, 5 Sequence
External clock rate	Up to 200 MSa/s		From Ext. clk0 & Ext.clk1 with standard TTL (1.4V Threshold) Combine OR, NOR, AND, NAND
Record length	32Ch: 256K x 2 /Ch 16Ch: 512K x 2 /Ch	32Ch: 1M x 2 /Ch 16Ch: 2M x 2 /Ch	Total = (256K / 1M) x 2 x 32 Ch
Number of Channels	Ch 0 ~ Ch31 (Pattern + Logic Analyzer. GOE — (Globe output enable active low). 2 External clock.		32 Channel Bi-Direction default to Ext.clk0, Ext.clk1 (OR, NOR, AND, NAND)
I/O Bandwidth	DC to 200 MHz		With < 30pF load
Input Impedance	100 KΩ // 8pF		With 100 Ohm series
Max. input voltage	+10V to -2V		
I/O Type (drive current, threshold)	LVC1.5V (10mA, 0.75V) LVC1.8V (12mA, 0.9V) LVC2.5V (16mA, 1.2V) LVC3.3V (20mA, 1.4V) SSTL2 II 2.5V (16mA, 0 to 2.4V) SSTL3 II 3.3V (16Ma, 0 to 3V)		Drive current (Balance source and sink) Standard Logic I/O.
Output enable delay	Typical < 10 ns		Input/Output Bi-Direction change
Channel skew	Typical < 200 ps		
Trigger position	-67M to 256K / 512K	-67M to 1Mega / 2Mega	Any position for user defined
Max. Trigger speed	200MHz / 5ns		
Trigger Qualify	0, 1, x (don't care) Settings for all digital channels		Simultaneous trigger Pattern and Logic channel
Power Supply	No External Power Source Require		From USB Port < 450mA
Net Weight	120 Grams		
Size (Dimension)	107mm x 77mm x 16mm		
Accessories	Color wires Harness + clips, USB 2.0 cable User's Manual, CD driver		

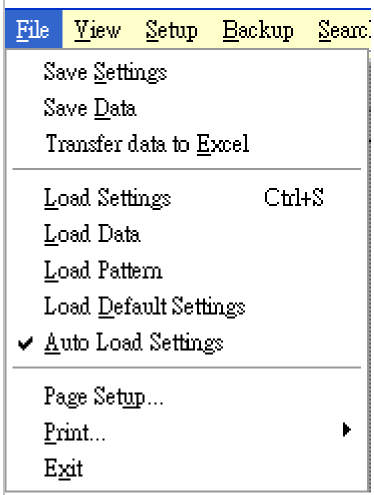
PG-32200 Series Specifications

Model	PG-32200K [256K]	PG-32200M [1 Mega]	Remark
Pattern update rate Logic sampling rate	From 1Sa/s to 200 Msa/s		With 1, 2, 5 Sequence
External clock rate	Up to 100 MSa/s		From Ext. clk0 & Ext.clk1 with standard TTL (1.4V Threshold) Combine OR, NOR, AND, NAND
Record length	32Ch: 256K x 2 /Ch	32Ch: 1M x 2 /Ch	Total = (256K / 1M) x 2 x 32 Ch
Number of Channels	Ch 0 ~ Ch31 (Pattern + Logic Analyzer. GOE — (Globe output enable active low). 2 External clock.		32 Channel Bi-Direction default to Ext.clk0, Ext.clk1 (OR, NOR, AND, NAND)
I/O Bandwidth	DC to 100 MHz		With < 30pF load
Input Impedance	100 KΩ // 8pF		With 100 Ohm series
Max. input voltage	+10V to -2V		
I/O Type (drive current, threshold)	LVC1.5V (10mA, 0.75V) LVC1.8V (12mA, 0.9V) LVC2.5V (16mA, 1.2V) LVC3.3V (20mA, 1.4V) SSTL2 II 2.5V (16mA, 0 to 2.4V) SSTL3 II 3.3V (16Ma, 0 to 3V)		Drive current (Balance source and sink) Standard Logic I/O.
Output enable delay	Typical < 10 ns		Input/Output Bi-Direction change
Channel skew	Typical < 200 ps		
Trigger position	-67M to 256K / 512K	-67M to 1Mega / 2Mega	Any position for user defined
Max. Trigger speed	100MHz / 10ns		
Trigger Qualify	0, 1, x (don't care) Settings for all digital channels		Simultaneous trigger Pattern and Logic channel
Power Supply	No External Power Source Require		From USB Port < 450mA
Net Weight	120 Grams		
Size (Dimension)	107mm x 77mm x 16mm		
Accessories	Color wires Harness + clips, USB 2.0 cable User's Manual, CD driver		

I/O Pin Location



File Menu



The File menu offers the following:

Save setting This option saves the current settings to a setting file (.ini).

Save data This option saves a data file (.La) depend on Depth setting.

Transfer data to Excel This option will convert data to Microsoft Excel by decimal, hexdecimal, ASCII.

Load setting This option loads a previously Setting file (.ini).

Load data This option loads a data file (.La), with a setting file (.ini) together to viewer memory.

Load pattern This option loads a data file (.La), with a setting file (.ini) together to pattern memory.

Load Default Setting Reset all parameters to factory defaults.

Auto Load settings Auto load PG-32200.ini setting file on program start run to set all configuration. Turns on or turns off the Autoload option. When this option is on, all settings will be loaded when start the program.

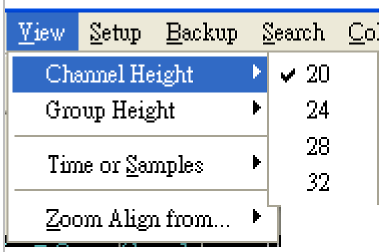
Print Setup Output style, printer and printer connection. This option brings up two dialog boxes:

1. Print settings allows you to configure what to output.
2. Print Setup dialog box allows you to configure

Print Screen This option allows you to print Screen (Hard copy).

Exit Exit Program. Use this command to end your session. You can also use the Close command on the application Control menu.

View Menu



The View menu offers the following:

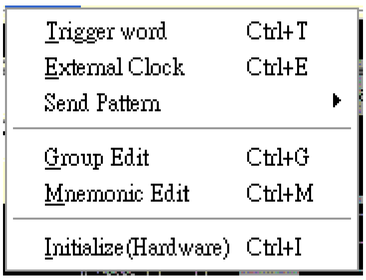
Channel Height Select display Channel Height as 20, 24, 28, 32 pixels.

Group Height Select display Group Height as 24, 28, 32, 36 pixels.

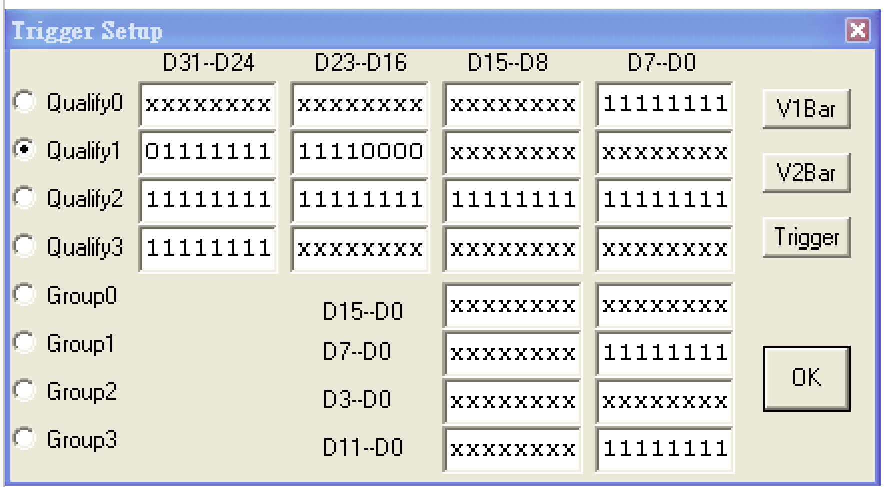
Time or Samples For Timing display, display Time like as 12.34ms, or display how many samples.

Zoom Align from Set cursor Bar {(V1, V2, Trigger, Screen (left or center)} for zoom operate reference.

Setup Menu

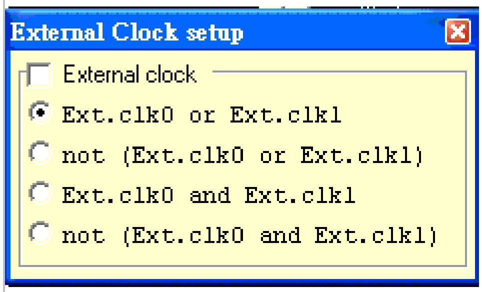


Trigger Word



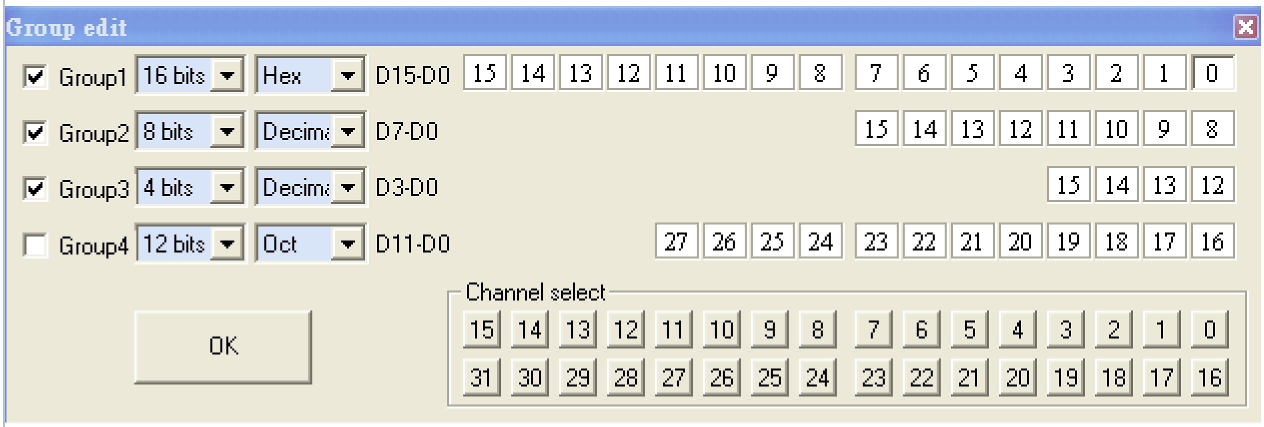
Set Trigger word for digital channel 31-0 or Group0-3.
The Trigger word backup four Qualify data and four Group data for quickly set digital trigger. You can setup from V bars.

External Clock



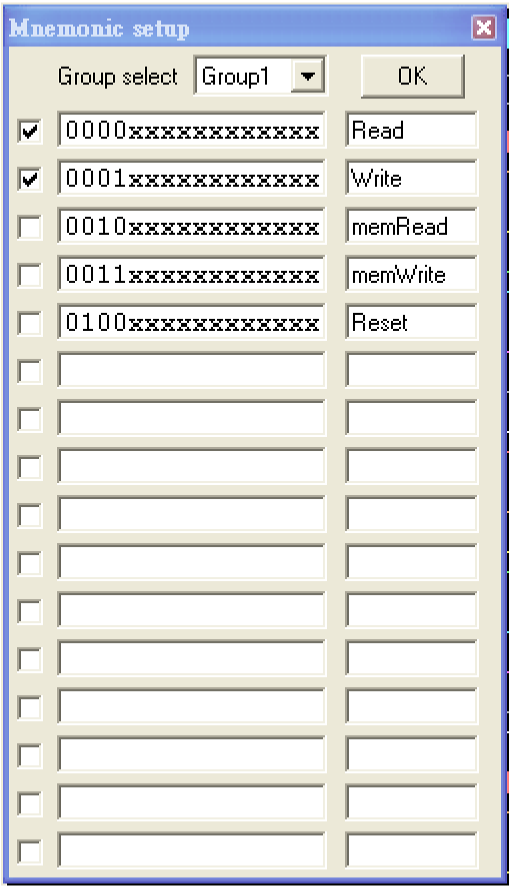
Two external clock combine logic OR, AND, not OR, not AND for select.

Group Edit



Edit channel 31-0 for Group Channel, every Group Channel supports 16bits Max.
could be display in hexdecimal, decimal, binary, octadic, ASCII code.

Mnemonic Edit



Initialize (Hardware)

This option allows you to restart PG-32200 or PG-32400.

Toolbar

GO The Go command tells the PG-32200 to start acquiring data when the trigger conditions are satisfied. Pressed means Start capture, un-pressed means stop capture. Moves one or more cursors to the display area. These commands are also available by clicking on the toolbar.

Moves Trigger Bar, V1Bar and V2Bar onto the waveform display area.

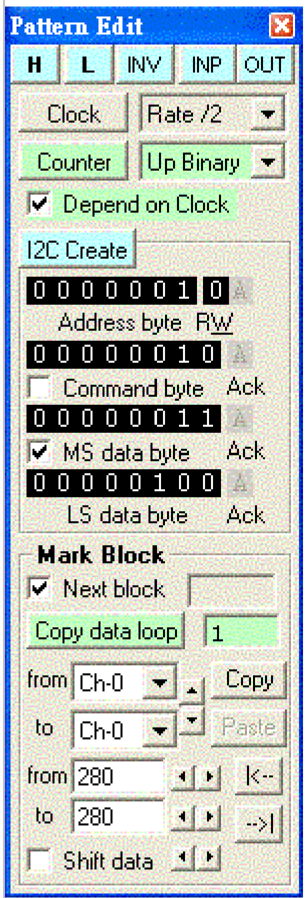
Centers waveform display area around V1Bar.

Centers waveform display area around V2Bar.

Centers waveform display area around the Trigger Bar.

EDIT **[Edit Pattern data](#)**.

Pattern Editor



The Pattern Generation is completely integrated with the PG-32200. The two operate from the same clock source, whether the internal clock or the external clock. Patterns can loop continuously, loop until the Logic Analyzer triggers, or once on the users command. Allocation of channels between the Logic Analyzer and the Pattern Generation is in groups of 8 channels. Channels can be all logic analysis, all pattern generation, or any multiple of eight for pattern generation with the remaining channels as logic analysis. To select the configuration, simply change the "Config" in the software. Pattern generation up to the maximum number of channels of the PG-32200 is supported, limited only by the number of ports.

Patterns can be edited and defined in this window. It's a visual and convenient software. At first, must mark a block use mouse right key, and set **High, Low, Invert** or

Input: set port (8 channels) to input mode.

Output: set port (8 channels) to Output mode.

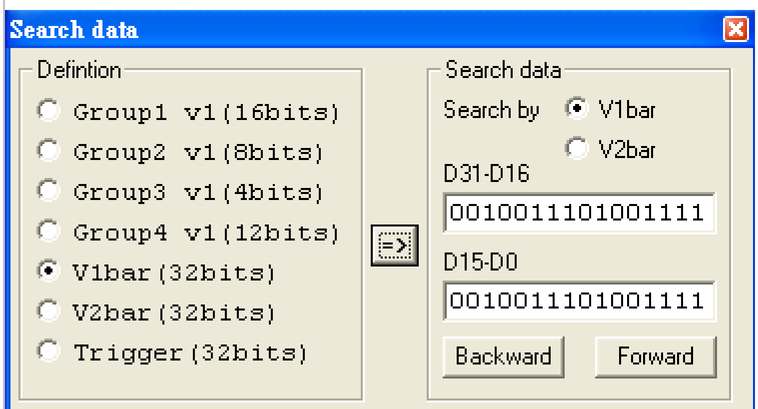
Clock: there are 5 rate for select.

Counter: up/down count can be depend on Clock or none.

I²C create: can be create I²C stream, just edit Address , Command, Data byte. You can also get data for the pattern data by capturing it from logic channels and copying it to the pattern channels.

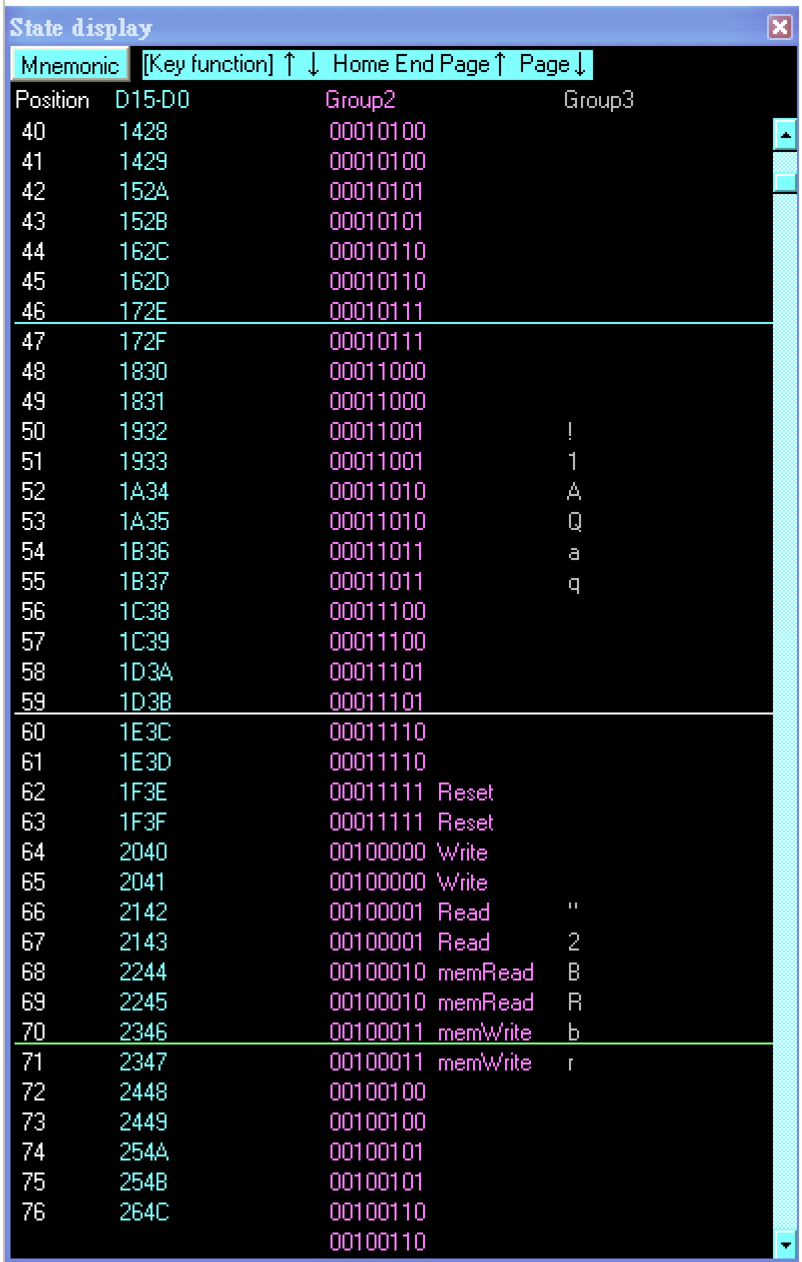
Pattern data can also come from data files created by this software or files that you create yourself.

Search Data



Sorting through all your data is easier with our search feature! You can specify a search pattern, including Don't Care bits, in any shown numeric bases. Then just click on the forwards or backwards search to find what you are looking for !

State List (Window Menu)



State display

Mnemonic [Key function] ↑ ↓ Home End Page↑ Page↓

Position	D15-D0	Group2		Group3
40	1428	00010100		
41	1429	00010100		
42	152A	00010101		
43	152B	00010101		
44	162C	00010110		
45	162D	00010110		
46	172E	00010111		
47	172F	00010111		
48	1830	00011000		
49	1831	00011000		
50	1932	00011001		!
51	1933	00011001		1
52	1A34	00011010		A
53	1A35	00011010		Q
54	1B36	00011011		a
55	1B37	00011011		q
56	1C38	00011100		
57	1C39	00011100		
58	1D3A	00011101		
59	1D3B	00011101		
60	1E3C	00011110		
61	1E3D	00011110		
62	1F3E	00011111	Reset	
63	1F3F	00011111	Reset	
64	2040	00100000	Write	
65	2041	00100000	Write	
66	2142	00100001	Read	"
67	2143	00100001	Read	2
68	2244	00100010	memRead	B
69	2245	00100010	memRead	R
70	2346	00100011	memWrite	b
71	2347	00100011	memWrite	r
72	2448	00100100		
73	2449	00100100		
74	254A	00100101		
75	254B	00100101		
76	264C	00100110		
		00100110		

Channels can be organized into groups and displayed on screen in ASCII, binary, decimal, hexdecimal, and user defined mnemonics. Channels can be displayed in any sequence. Time between V1bar, V2bar, and Trigger is displayed.

Color Setup



The color of each channel or Group can be set independently.

Pattern4k.la Data Format

000000	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
000010	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
000020	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
000030	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
001000	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
001010	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
001020	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
001030	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
002000	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
002010	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
002020	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
002030	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
002040	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
003000	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
003010	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
003020	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
003030	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
004000	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F
004010	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F
004020	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F
004030	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F

This is a Pattern data file.

It's buffer length is 4k, total length is 4kx5=20k.

0000 to 0FFF for Ch[7:0] (Port0)

1000 to 1FFF for Ch[15:8] (Port1)

2000 to 2FFF for Ch[23:16] (Port2)

3000 to 3FFF for Ch[31:24] (Port3)

4000 to 4FFF for Port input/output

- bit0: 1=output, 0=input, for port0
- bit1: 1=output, 0=input, for port1
- bit2: 1=output, 0=input, for port2
- bit3: 1=output, 0=input, for port3

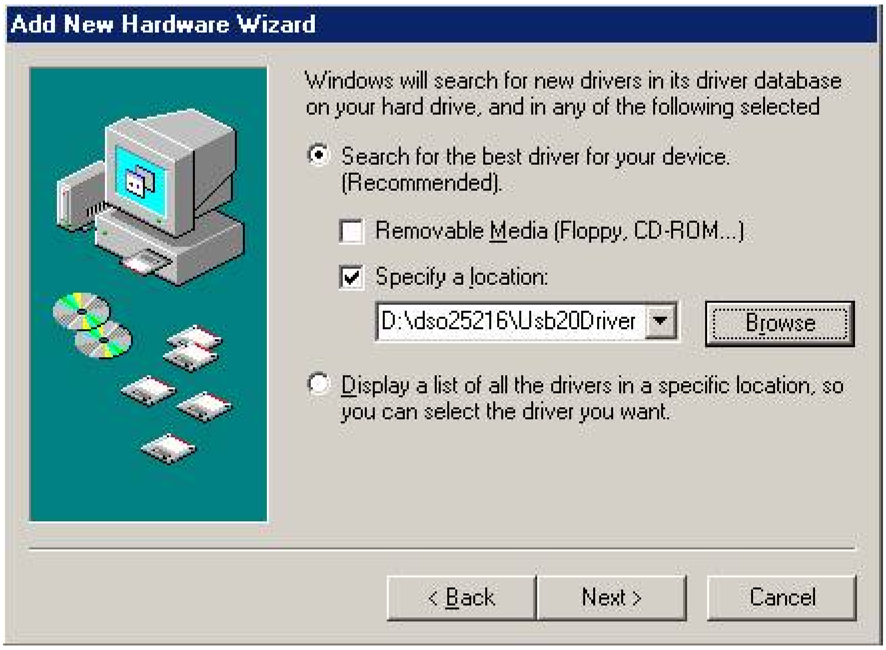
Window USB Driver Install

Windows 98/ME USB driver install

When USB2.0 control interface be connected to computer, screen will display



Click Next to continue



Edit or browse path to ...\USB20driver\win98_ME\gene.inf
(here D: is CD location, dso25216 may be dso29xx or la5000b or pg32200 or pg32400)
Click Next to continue



Click Next to continue



Completing install

Windows 2000 USB driver install

When USB2.0 control interface be connected to computer, screen will display



Click Next to continue



Click Next to continue



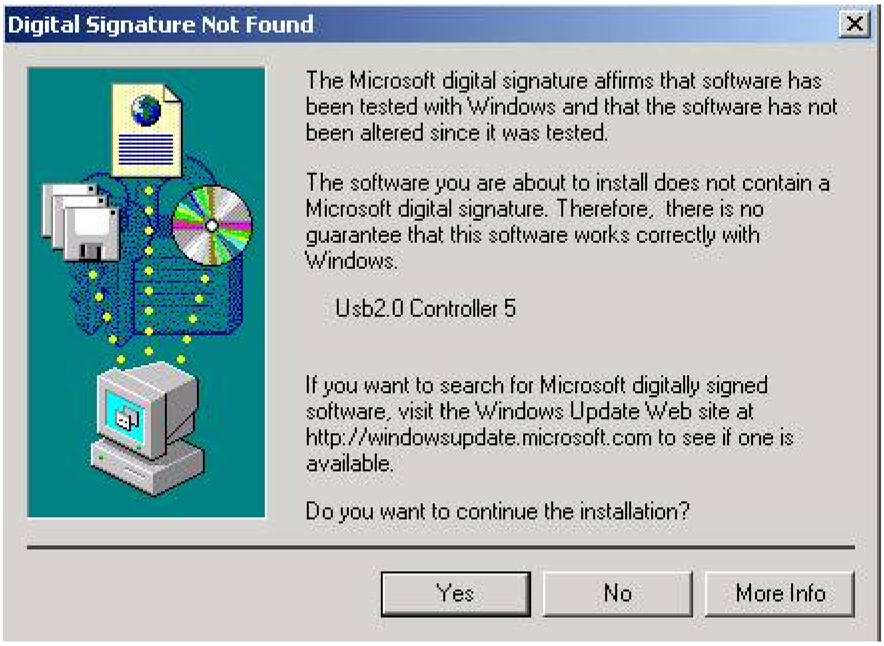
Click Next to continue



Edit or browse path to ...\USB20driver\win2000_XP\gene.inf
(here F: is CD location, dso25216 may be dso29xx or la5000b or pg32200 or pg32400)
Press OK



Click Next to continue



Click Yes to continue



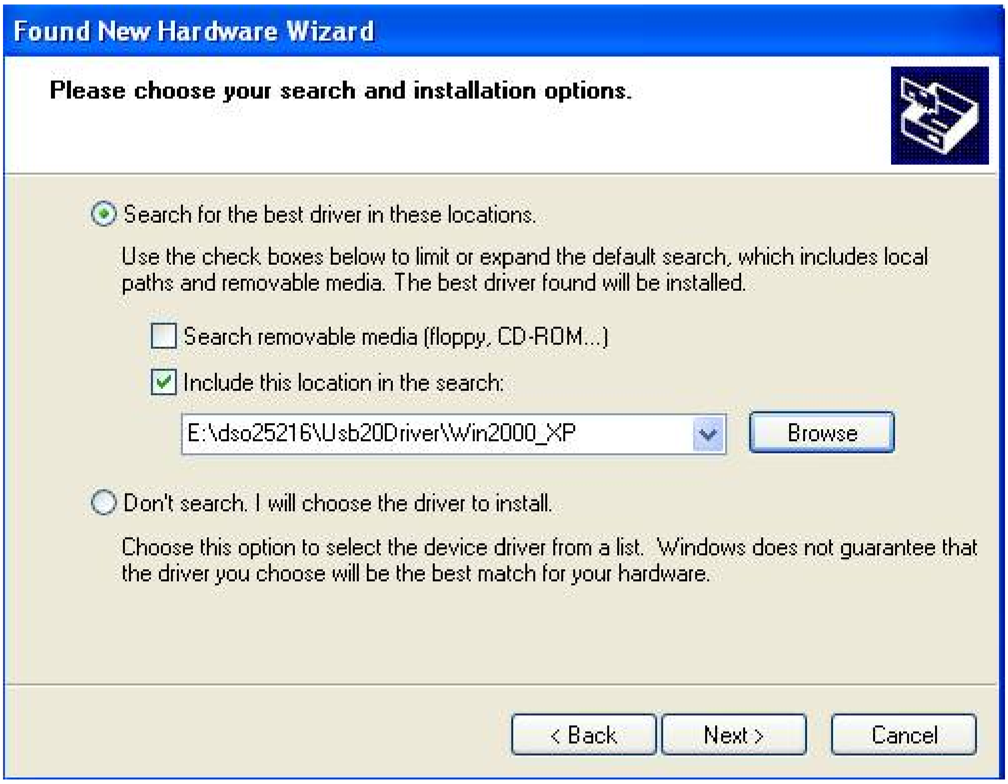
Completing install

Windows XP USB driver install

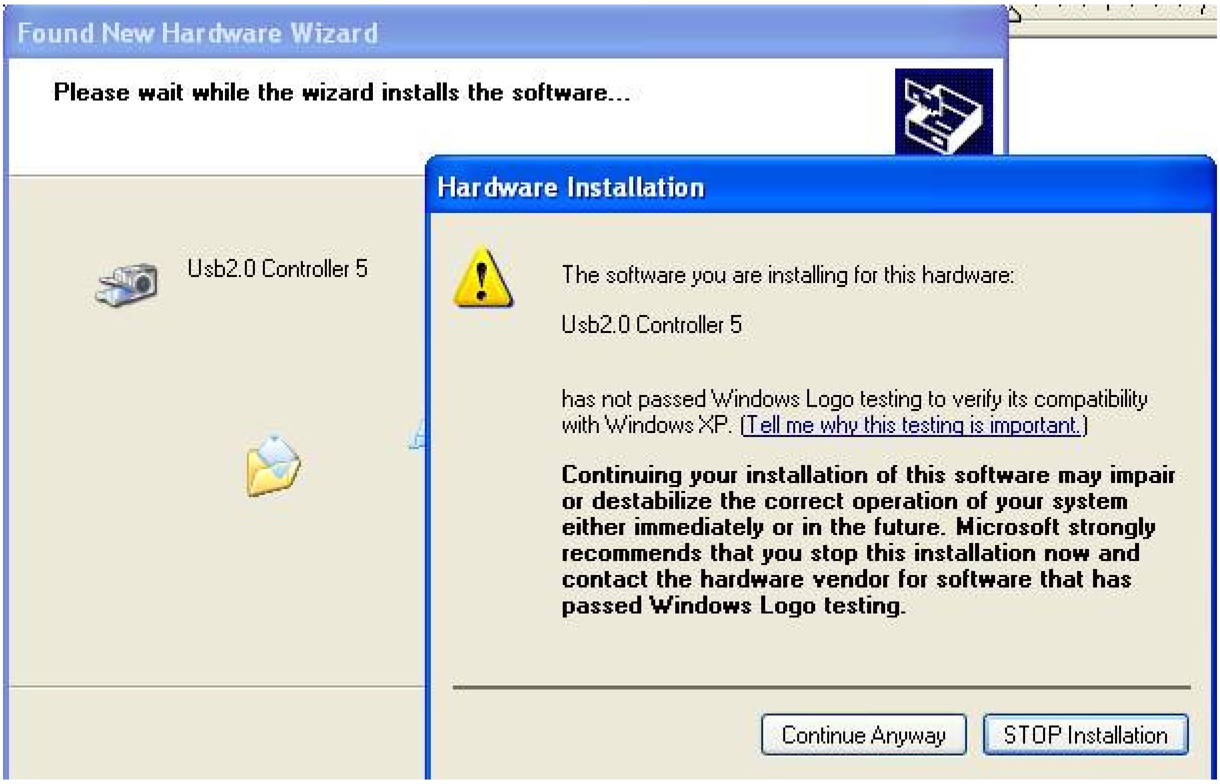
When USB2.0 control interface be connected to computer, screen will display



Click Next to continue



Edit or browse path to ...\USB20driver\win2000_XP\gene.inf
(here E: is CD location, dso25216 may be dso29xx or la5000b or pg32200 or pg32400)
Click Next to continue



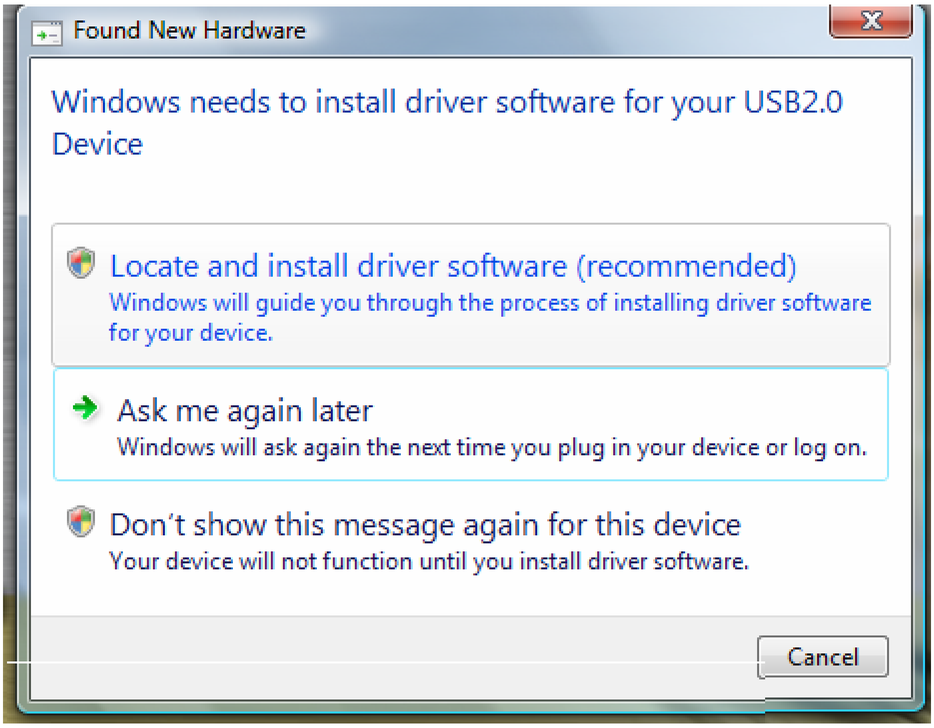
Press Continue Anyway



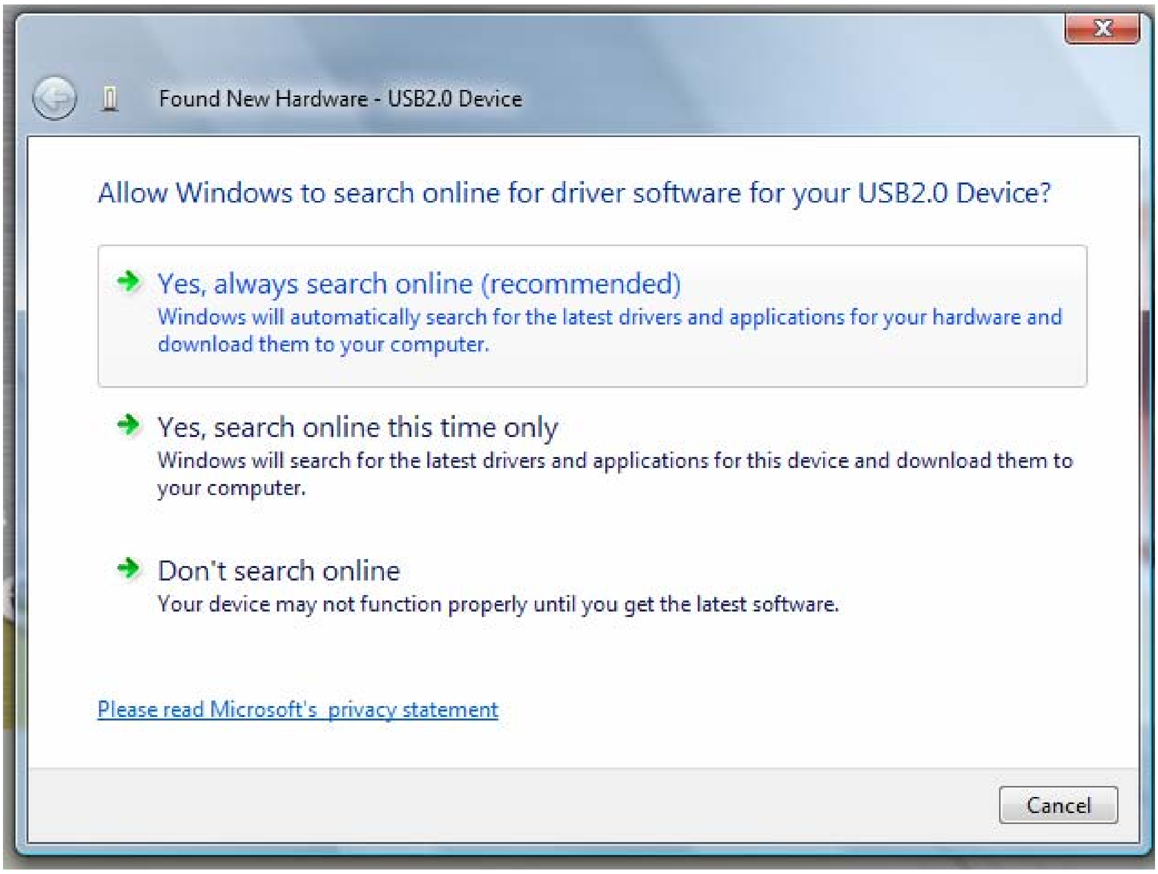
Completing install

Windows Vista USB driver install

When USB2.0 control interface be connected to computer, screen will display as following:



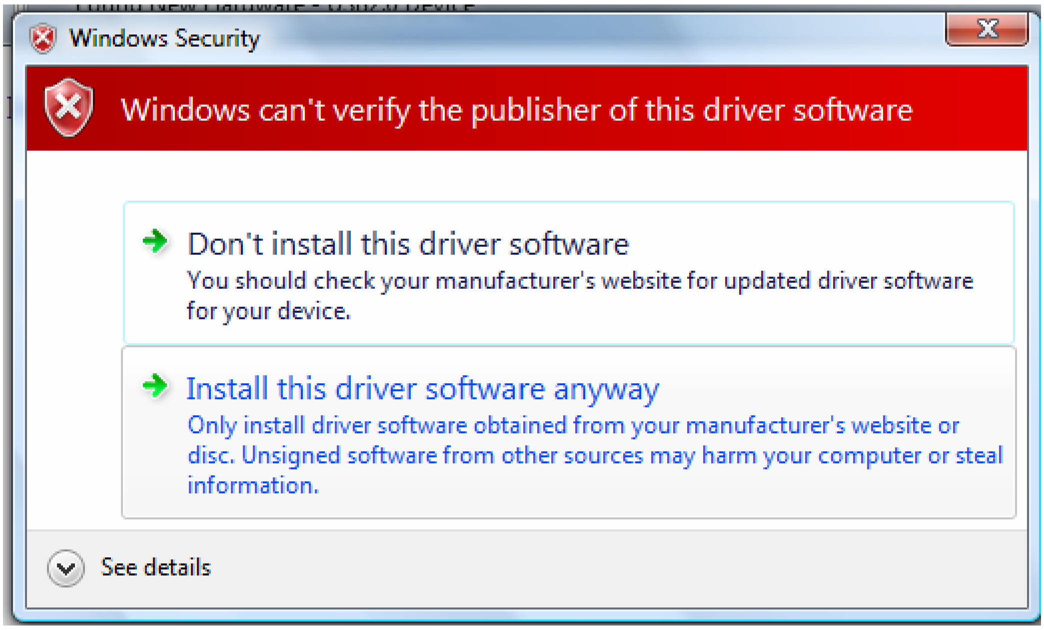
Press **Locate and install driver software (recommended)** Continue Anyway



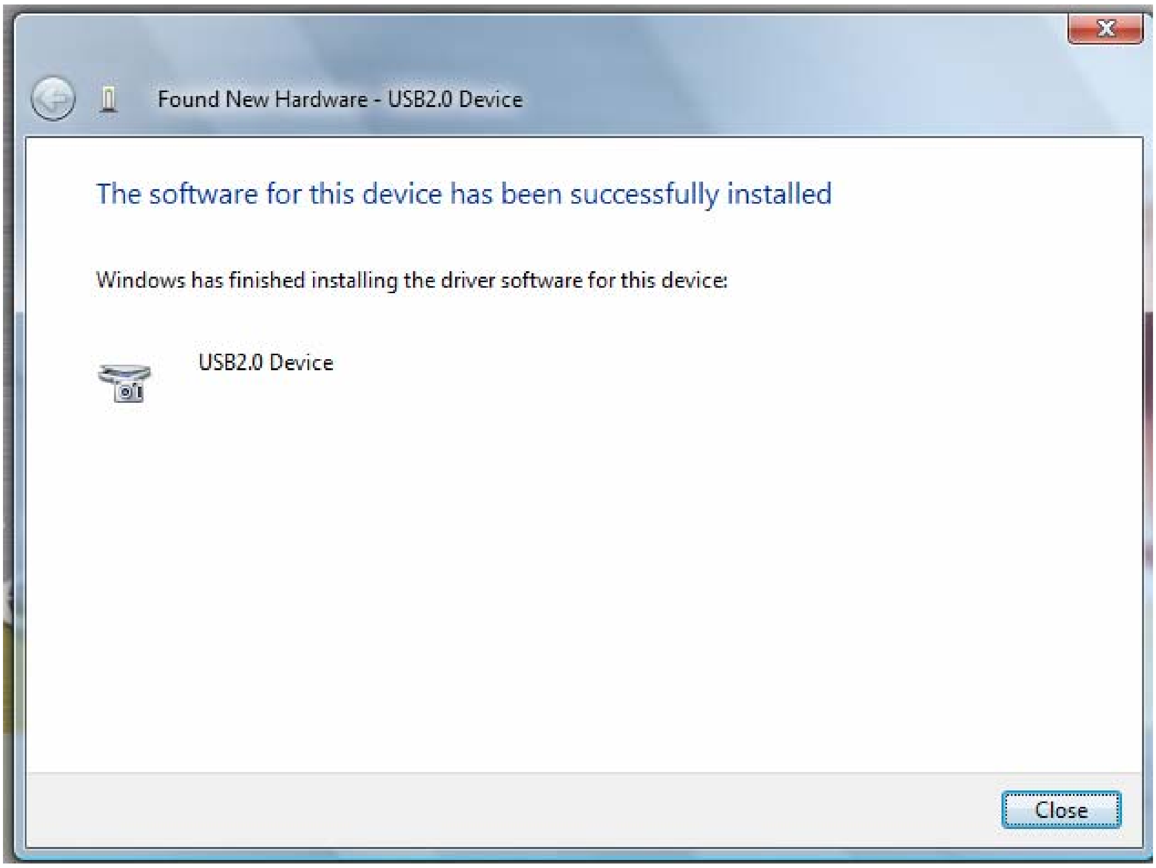
Press Continue Anyway



Press **Insert the disc that came with your USB2.0 Device**
Click Next to continue



Press **Install this driver software anyway** to Continue



Completing install

Technical Support

Technical Support can be reached at

CLOCK COMPUTER CORP.

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Roosevelt Road. Taipei, 116. Taiwan.
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Fax: 886-2-29331687.
Email: ufclockc@ms9.hinet.net

Software Updates

Software can be downloaded from our website
Web: www.clock-link.com.tw
Software @copyright
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Roosevelt Road. Taipei, 116. Taiwan.

Phone: 886-2-29321685. 29340273. 29335954.
Fax: 886-2-29331687.
Email: ufclockc@ms9.hinet.net